

Scope of Claims

What is claimed is,

1. A magneto impedance sensor element with electromagnetic coil comprised of:

    a terminal board on which an extended groove extending in one direction has been formed; and an electromagnetic coil, made with one part of the coil formed spirally inside said extended groove on said terminal board, and joined to each tip of that part the other part of the coil placed across the top of the groove so that together the two parts and form a complete spiral; and

    insulating material placed in the extended groove on said terminal board; and

    a magnetic sensitive body inserted within said insulating material, to which either high frequency or pulse electric current is applied; and wherein,

when either high frequency or pulse electrical current is applied to said magnetic sensitive body, voltage is output from said electromagnetic coil in response to the intensity of the external magnetic field generated in said electromagnetic coil.

2. The magneto impedance sensor element with

electromagnetic coil as recited in claim 1, wherein said magnetic sensitive body is made from of conductive magnetic amorphous metal wire.

3. The magneto impedance sensor element with electromagnetic coil as recited in claim 2, wherein the inner coil diameter of said electromagnetic coil is less than 200 micrometers.

4. The magneto impedance sensor element with electromagnetic coil as recited in claim 3, wherein said electromagnetic coil has a line spacing separation per turn of less than 100 micrometers.

5. The magneto impedance sensor element with electromagnetic coil as recited in claim 2, wherein the length of said magnetic sensitive body has been set at less than 3 mm.

6. The magneto impedance sensor element with electromagnetic coil as recited in claim 2, wherein the ratio of wire diameter to wire length used in said magnetic sensitive body has been set at an aspect ratio from 10 to 100.

7. The magneto impedance sensor element with electromagnetic coil as recited in claim 6, wherein the inner coil diameter of said electromagnetic coil has been set from 1.005 to 10 times the wire diameter of said magnetic

sensitive body.

8. The magneto impedance sensor element with electromagnetic coil as recited in claim 2, wherein the inner coil diameter of said electromagnetic coil is less than 100 micrometers.

9. The magneto impedance sensor element with electromagnetic coil as recited in claim 3, wherein the line spacing separation per turn of said electromagnetic coil is less than 50 micrometers.